

## RESEARCH ARTICLE

 Mehmet Akif Nas<sup>1</sup>  
 Gokburak Atabay<sup>2</sup>  
 Furkan Sakiroglu<sup>3</sup>  
 Yasemin Cayir<sup>3</sup>

<sup>1</sup>Aşkale State Hospital,  
Department of Family Medicine,  
Erzurum, Turkey

<sup>2</sup>Ceylanoglu Family Health  
Center, Erzurum, Turkey

<sup>3</sup>Atatürk University Faculty of  
Medicine, Department of Family  
Medicine, Erzurum, Turkey

### Corresponding Author:

Yasemin Cayir

Ataturk University Faculty of Medicine,  
Department of Family Medicine,

Yakutiye, Erzurum, Turkey

mail: dryasemincayir@yahoo.com

Phone: +90 5331382741

Received: 01.06.2020

Acceptance: 21.08.2020

DOI: 10.18521/ktd.744687

Konuralp Medical Journal  
e-ISSN1309-3878  
konuralptipdergi@duzce.edu.tr  
konuralptipdergisi@gmail.com  
www.konuralptipdergi.duzce.edu.tr

## Vaccine Rejection in a University's Training Family Health Centers

### ABSTRACT

**Objective:** It was aimed to determine the vaccine rejection rates and affecting factors in the Training Family Health Centers (TFHC) affiliated with a department of family medicine.

**Methods:** This study was designed as a mixed research and conducted in two TFHC of Department of Family Medicine of Atatürk University. In 2018, parents who did not receive at least one of the vaccines required under the Ministry of Health's Extended Immunity Program were included. Semi-structured interview technique was used on the telephone as the data collection method. Content analysis was applied statistically. An in-depth interview was done with 6 volunteering parents.

**Results:** The mean age was 30±1.2 years for both parents. All parents (n=6) who refused vaccination were university graduates. 66.7% of the parents (n=4) had high monthly income. According to the medical records of 749 children between 0-16 ages who were supposed to be vaccinated in 2018, it was observed that in nine children (1.2%), at least one vaccine was missing. Four children were not vaccinated due to distrust to the vaccine. Three of the parents refused vaccination due to complications developed after previous vaccinations.

**Conclusions:** Vaccine rejection rates were found low in our TFHCs and socioeconomic levels of them were high. The most important factors affecting vaccine rejection were the lack of confidence in the vaccine content and insufficient information about vaccines.

**Keywords:** Vaccine Rejection, Vaccine Hesitancy, Anti-Vaccination Parents, Family Health Center

## Bir Üniversitenin Eğitim Aile Sağlığı Merkezlerinde Aşı Reddi

### ÖZET

**Amaç:** Bu çalışmada bir Aile Hekimliği Anabilim Dalı'na bağlı Eğitim Aile Sağlığı Merkezleri'nde (EASM) aşı reddi oranlarının ve etkileyen faktörlerin belirlenmesi amaçlanmıştır.

**Gereç ve Yöntem:** Bu çalışma karma bir araştırma olarak tasarlanmış ve Atatürk Üniversitesi Aile Hekimliği Anabilim Dalı'nın iki EASM'sinde yürütülmüştür. Çalışmaya 2018 yılında Sağlık Bakanlığı'nın Genişletilmiş Bağışıklık Programı kapsamında yapılması gerekli aşılarından en az birini almayan ebeveynler dahil edilmiştir. Veri toplama yöntemi olarak telefonda yarı yapılandırılmış görüşme tekniği kullanılmış ve içerik analizi uygulanmıştır. Çalışmaya katılmaya gönüllü 6 ebeveyn ile derinlemesine bir görüşme yapılmıştır.

**Bulgular:** Her iki ebeveyn için ortalama yaş 30±1.2 yıldır. Aşı reddi yapan tüm ebeveynler (n=6) üniversite mezunuydu. Ebeveynlerin %66,7'si (n=4) yüksek gelir düzeyine sahipti. 2018 yılında aşılması gereken 0-16 yaş arası 749 çocuğun tıbbi kayıtlarına göre, 9 çocukta (%1,2) en az bir aşının eksik olduğu gözlemlendi. Dört çocuğa aşıya güvensizlik nedeniyle aşı yapılmamıştı. Ebeveynlerden üçü ise önceki aşılarından sonra gelişen komplikasyonlar nedeniyle aşılamayı reddetmişti.

**Sonuç:** EASM'lerde aşı reddi oranları düşük bulundu ve aşı reddi yapan ebeveynlerin sosyoekonomik düzeyleri yüksekti. Aşı reddini etkileyen en önemli faktörler, aşı içeriğine duyulan güvensizlik ve aşılar hakkında yetersiz bilgi idi.

**Anahtar Kelimeler:** Aşı Reddi, Aşı Kararsızlığı, Aşı Karşıtı Ebeveynler, Aile Sağlığı Merkezi

## INTRODUCTION

Vaccination is an essential preventive health service that has been used for many years to control infectious diseases and prevent complications and sequelae (1, 2). The World Health Organization (WHO) reported that 2 to 3 million deaths are prevented annually with vaccines, and 1.5 million more deaths can be prevented if vaccination reaches the desired levels (3). Thanks to the effectiveness of the vaccines, smallpox has been eradicated in the world, Turkey has received the "Polio-Free Zone" certificate, and maternal and neonatal tetanus has not been observed in Turkey for a long time (4).

The WHO has accepted vaccine rejection as one of the 10 global threats in 2019 (3). Despite all the known benefits of vaccines, anti-vaccine attitudes are increasing in the world (4-7). It is anticipated that vaccine rejection is gradually rising in Turkey, and if this rate continues, vaccination rates will decrease below 80% after five years (4). It is expected that this will impair social immunity and that there may be significant increases in the incidence of rare infectious diseases; even eradicated diseases may reappear (4, 8).

Studies on vaccine rejection are limited in Turkey. There are no official and precise data on vaccine rejection rates. It is known that there are differences between countries regarding vaccine rejection and its reasons; even regional differences exist in the same country (9). The implementation of the first two years of childhood vaccinations in Turkey is performed by the family health centers (FHC), while the task of immunization of the school children is accomplished by the community health centers. If school vaccines cannot be administered, the child is asked to be vaccinated by the registered FHC.

FHCs have a crucial significance concerning proper vaccinations and covering large populations. As a result, there is a need to identify the vaccine rejection rates in FHCs and to reveal the causes. This study aimed to determine the vaccine rejection rates and affecting factors in the Training Family Health Centers (TFHC) affiliated with a department of family medicine.

## MATERIAL AND METHODS

This study was designed as mixed research, using both qualitative and quantitative data. The study was carried out in Atatürk University Faculty of Medicine Department of Family Medicine in

June 2019. There are two TFHCs belonging to Department of Family Medicine. TFHC-1 has three family health units, and TFHC-2 has two family health units. Parents of children aged 0-16 with at least one missing vaccination from the 2018 extended immunity program childhood vaccination schedule, who could be reached by phone and who agreed to participate, were included in the study. Parents were accessed through the phone numbers registered in the Family Medicine Information System. The medical records of 749 children who were supposed to be vaccinated in 2018 were examined. It was observed that in 9 children (1.2%), at least one vaccine was missing. An in-depth interview was done with 6 volunteering parents.

Data collection was performed via phone calls using a semi-structured in-depth interview technique. A data collection form was used to determine the socio-demographic characteristics of the parents. Questions included demographic information of the parents (age, educational level, monthly income) and reasons for vaccine rejection. Parents who have monthly income 5000 and under 5000 Turkish Lira were accepted as low income, and have monthly income over 5000 Turkish Lira were accepted as high income.

The interviews were quantitatively assessed about how their structure was performed. Telephone interviews were transcribed verbatim. Thematic content analysis was performed for qualitative data.

The study protocol was approved by the ethics committee of Atatürk University Faculty of Medicine (Protocol Number: B.30.2.ATA.0.01.00/1). Statistical analysis was done with content analysis, and numerical data were presented as numbers, percentages, and standard deviations with the SPSS 23.0 package program (SPSS Inc., Chicago, IL, USA).

## RESULTS

The mean age was 30±1.2 years for the parents. All parents (n=6) who refused vaccination were university graduates. Of the parents, 2 (33.3%) had low monthly incomes, while 4 (66.7%) had high monthly income. The general characteristics of the participants are presented in Table 1.

**Table 1.** General features of the participants

	Interviewed parent	Education of mother/father	Mother/Father profession	Monthly income
P 1	Father	University/University	Academic staff/Academic staff	High
P 2	Mother	University/University	Housewife/Academic staff	High
P 3	Mother	University/University	Academic staff/Academic staff	High
P 4	Mother	University/University	Housewife/Academic staff	High
P 5	Father	University/University	Housewife/Officer	Low
P 6	Father	High school/University	Housewife/Self-employment	Low

P: parent

The rates of vaccination rejections for the each age group are demonstrated in Table 2. According to the medical records of 749 children between 0-16 age who were supposed to be vaccinated in 2018, it was observed that in 9 children (1.2%), at least one vaccine was missing. 5 (2.5%) of the 200 children aged 0-16 registered to the TFHC-1 and 4 (0.7%) of the 549 children aged 0-16 registered to THFC-2 had missing vaccinations. Missing vaccinations were observed in 3 (3.3%) out of 89 children aged 0-2 years

registered to the TFHC-1, and 4 (1.32%) of 301 children between the ages of 0-2 registered to the TFHC-2. On the other hand, when the primary school first-grade vaccines were examined, it was found that 1 (1.96%) of 51 children enrolled in the TFHC-1 had missing vaccinations. In TFHC-2, all 147 children (100%) were vaccinated. Eighth-grade vaccines in primary school were examined, and it was seen 1 (1.66%) of the 60 children registered to the TFHC-1 had missing vaccinations, while all 101 children (100%) in the TFHC-2 were vaccinated.

**Table 2.** The rates of vaccination rejections in the age groups

Age groups	Total children (n)	Total vaccine rejection (n - %)	TFHC-1 (n - %)	TFHC-2 (n - %)
0-2 age	390	7 – 1.7%	3 – 3.30%	4 – 1.32%
1 <sup>st</sup> grade	198	1 – 0.5%	1 – 1.96%	0 – 0%
8 <sup>th</sup> grade	161	1 – 0.6%	1 – 1.66%	0 – 0%
0-16 ages	749	9 – 1.2%	5 – 2.5 %	4 – 0.7%

Of the parents, 83.3% (n=5) stated that families decided to refuse the vaccination by the agreement of both parents, and one child (16.7%) could not be vaccinated because he was afraid of the vaccine. All parents (n=6) mentioned that it was easy to access vaccination and that they were well informed by the healthcare professionals about the significance and side effects of the vaccines:

*“I know that I can easily access all the vaccinations without any payment”.*

The reasons for not getting vaccinated were examined, and it was seen that four children were not vaccinated due to distrust to the vaccine:

*“I do not trust the vaccines, I am concerned about the content of them.”*

It was observed that 3 of the parents did not want their children to get vaccinated due to complications developed after previous vaccinations. One parent rejected the immunization due to different schedules between countries and changes in the schedules and the resulting insecurity of this change:

*“I do not understand why all countries do not have same vaccine schedule. In our country, the vaccine schedule changes in every year. This situation causes insecurity in our family.”*

One parent thought that the vaccine was not so important because it was not obligatory. On the other hand, one child was not vaccinated because he was afraid of vaccination.

When asked about the sources of information about vaccination, it was seen that all parents (n=6) used social and visual media. Two parents also accessed information about the vaccine from publications, one obtained information from the neighbors, and one attained knowledge by consulting a physician. None of the parents was aware of the Ministry of Health’s website containing the vaccination schedule.

Five of the parents said that having an oral or nasal form of vaccines would not affect vaccine

rejection decisions. However, the parents who could not apply the vaccine because their child was afraid said that if these forms were found, they could easily vaccinate their child. Two parents stated that they were not allowed to be discharged from the hospital until the child was vaccinated. Hence, they wanted but could not prevent vaccination against the Hepatitis B virus. Two parents stated that there were no anti-vaccination campaigns when their children were born, and one parent explained that they did not get vaccinated at birth.

While one parent thought that the MMR (Measles, Mumps, Rubella) vaccine could cause autism, another parent stated that she would only get the MMR vaccine to her child because she was informed that there was an outbreak of measles in Turkey. All parents (n=6) agreed that they would administer the vaccines if they would be produced in Turkey.

Parents were also asked about the newborn screening tests, breastfeeding, the use of recommended vitamin and mineral supplements, the month of starting complementary feeding, refrain from medications in the event of disease (despite the doctor’s suggestion), and the status of Hepatitis B vaccination at birth. All parents interviewed agreed to the breast milk recommendations of the ministry of health and/or the transition to complementary feeding. Only one parent did not comply with the newborn screening tests, and heel prick test was not performed from their child. Although children of four parents were recommended medications by the doctors in times of sickness, they did not use them, especially if they were antibiotics. Two of the six parents did not use vitamin D and iron supplements at all, and one was using them irregularly.

## DISCUSSION

In our study, the total vaccine rejection rate in TFHC’s affiliated with the university was found

to be 1.2%. Since there is no precise data about vaccine rejection rates in Turkey, it is difficult to compare our findings. However, even when the age groups are examined individually, it can be said that the vaccination rates in the TFHCs are above the targets of the Ministry of Health of the Republic of Turkey (10).

In this study, the monthly income and educational levels of parents who rejected vaccinations were high. TFHC-1 primarily serves academic staff, administrative staff, and students. Thus, they are expected to have a higher socioeconomic level than the general population. Interestingly, the vaccine rejection rate on the THFC-1 was higher than that of the TFHC-2, which is similar to the other FHCs in the city. In a previous study, vaccination rates increased parallel to maternal education; no relationship was found with paternal schooling and socioeconomic level (11). In the study conducted by Topçu et al. in Ankara and Adiyaman in 2019, it was found that the monthly income and educational status of those who rejected the vaccine were lower than those who received the vaccine (12). A study conducted in the USA revealed that vaccine rejection rates were higher in those with a higher socioeconomic status (13). In low- and middle-income countries, anti-vaccination attitudes and low educational levels coexist, while in high-income countries, the reverse is true. Today, the level of vaccination is higher in well-educated and high-income families (14).

When vaccination rejection reasons were examined, it was seen that a child was not vaccinated due to fear of needles. The family stated that they wanted to have the vaccine, but could not get it done because of the child's anxiety. The same family expressed that oral or nasal vaccines would be a suitable solution. In one study, 63% of children reported fear of needles, 8% reported non-compliance, and 5% postponed the vaccine due to fear of needles in the child (15). In our study, the decision of vaccination rejection in the case with fear was given by the parents and the child together.

When the reasons for not getting vaccinated were examined, it was seen that four families rejected the vaccine due to not trusting the vaccine content and one family due to the distrust caused by the different vaccination calendars in different countries and their frequent changes. One of the families rejected vaccination because the ministry of health did not force people for vaccination. Leaving the initiative to the parents may produce an idea that vaccination is not crucial. One parent did not send his child for the heel prick test, and four parents did not use the drugs recommended to their children (especially antibiotics), although they were prescribed by the doctor when they were sick. Considering these findings, it can be concluded that families who refuse vaccines do not trust the health system and health professionals. Increased trust in

the healthcare system and healthcare professionals has been previously shown to increase vaccination rates (16-18). Additionally, adding new vaccines to childhood vaccines, rapid developments and changes in the field of vaccines, and the different vaccination programs in different countries may create negative perceptions in parents (14). This suggests that vaccination adherence can be increased by providing more detailed information to families about possible changes in the vaccination schedules.

While one parent absolutely rejected the vaccine because of the thought that the MMR vaccine could cause autism, another parent was informed that there was a measles outbreak in Turkey through the media; thus, he would only allow the child to have the MMR vaccine. There is strong evidence that MMR vaccination is not related to autism (19, 20), and even other vaccines and compounds such as thimerosal and mercury, which are protective agents in vaccines, do not cause an increase in autism spectrum disorders (20). While the Turkish Ministry of Health has a web page titled "Vaccine Content", parents are not aware of this service (21). Families stated that they generally received information about vaccines through social and visual media. On the other hand, anti-vaccine misinformation spreads easier and faster through the media (22), and families with anti-vaccination attitudes are more active on the internet searching for information than other families (23). Although two giant social media companies, Facebook and YouTube, have stated that they will apply sanctions against anti-vaccination pages, there is still much false information on the internet (23, 24). Two parents in our study obtained contradictory information through the media. There are worrisome increases in cases of measles in the European geography, including Turkey. Measles began to reappear in countries where it had been eliminated (25, 26). Furthermore, measles outbreaks primarily affect unvaccinated societies (27).

All parents who participated in our study stated that it was easy to access the vaccine, and they were well informed by the healthcare professionals about the significance and side effects of the vaccines.

## CONCLUSION

This study demonstrated that vaccine rejection rates were low in our TFHCs. However, interestingly, those who rejected vaccination had high socioeconomic levels. It was observed that the parents who refused the vaccine did not trust the vaccine's content, and had different and insufficient information about vaccines. It was understood that studies with broader participation should be done on behalf of preventive medicine, and appropriate strategies should be developed against the increasing trend of vaccine rejection.

**REFERENCES**

1. Omer SB, Salmon DA, Orenstein WA, Dehart MP, Halsey N. Vaccine refusal, mandatory immunization, and the risks of vaccine-preventable diseases. *New England Journal of Medicine*. 2009;360(19):1981-8.
2. Larson HJ, Jarrett C, Schulz WS, Chaudhuri M, Zhou Y, Dube E, et al. Measuring vaccine hesitancy: the development of a survey tool. *Vaccine*. 2015;33(34):4165-75.
3. World Health Organisation. Ten Threats to Global Health in 2019. Erişim tarihi:11.06.2019 <https://www.who.int/emergencies/ten-threats-to-global-health-in-2019>.
4. Bozkurt HB. Aşı Reddine Genel Bir Bakış ve Literatürün Gözden Geçirilmesi. *KAFKAS*.71.
5. Blume S. Anti-vaccination movements and their interpretations. *Social science & medicine*. 2006;62(3):628-42.
6. Black S, Rappuoli R. A crisis of public confidence in vaccines. *American Association for the Advancement of Science*; 2010.
7. Larson HJ, Jarrett C, Eckersberger E, Smith DM, Paterson P. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: a systematic review of published literature, 2007–2012. *Vaccine*. 2014;32(19):2150-9.
8. Fefferman NH, Naumova EN. Dangers of vaccine refusal near the herd immunity threshold: a modelling study. *The Lancet Infectious Diseases*. 2015;15(8):922-6.
9. Dubé E, Gagnon D, Nickels E, Jeram S, Schuster M. Mapping vaccine hesitancy—Country-specific characteristics of a global phenomenon. *Vaccine*. 2014;32(49):6649-54.
10. Türkiye Cumhuriyeti Sağlık Bakanlığı. Genişletilmiş Bağışıklama Programı Genelgesi. Erişim Tarihi: 16.06.2019 <https://dosyasb.saglik.gov.tr/Eklenti/1117,gbp genelge2008pdf.pdf> [11.06.2019]. Available from: <https://dosyasb.saglik.gov.tr/Eklenti/1117,gbp genelge2008pdf.pdf>.
11. Altınkaynak S, Ertekin V, Güraksın A, Kılıç A. Effect of several sociodemographic factors on measles immunization in children of Eastern Turkey. *Public health*. 2004;118(8):565-9.
12. Topçu S, Almış H, Başkan S, Turgut M, Orhon FŞ, Ulukol B. Evaluation of childhood vaccine refusal and hesitancy intentions in Turkey. *The Indian Journal of Pediatrics*. 2019;86(1):38-43.
13. Leib S, Liberatos P, Edwards K. Pediatricians' experience with and response to parental vaccine safety concerns and vaccine refusals: a survey of Connecticut pediatricians. *Public Health Reports*. 2011;126(2\_suppl):13-23.
14. Dubé E, Vivion M, MacDonald NE. Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: influence, impact and implications. *Expert review of vaccines*. 2015;14(1):99-117.
15. Taddio A, Ipp M, Thivakaran S, Jamal A, Parikh C, Smart S, et al. Survey of the prevalence of immunization non-compliance due to needle fears in children and adults. *Vaccine*. 2012;30(32):4807-12.
16. Benin AL, Wisler-Scher DJ, Colson E, Shapiro ED, Holmboe ES. Qualitative analysis of mothers' decision-making about vaccines for infants: the importance of trust. *Pediatrics*. 2006;117(5):1532-41.
17. Marlow LA, Waller J, Wardle J. Trust and experience as predictors of HPV vaccine acceptance. *Human vaccines*. 2007;3(5):171-5.
18. van der Weerd W, Timmermans DR, Beaujean DJ, Oudhoff J, van Steenberghe JE. Monitoring the level of government trust, risk perception and intention of the general public to adopt protective measures during the influenza A (H1N1) pandemic in the Netherlands. *BMC public health*. 2011;11(1):575.
19. Hviid A, Hansen JV, Frisch M, Melbye M. Measles, Mumps, Rubella Vaccination and Autism: A Nationwide Cohort Study. *Annals of internal medicine*. 2019.
20. Taylor LE, Swerdfeger AL, Eslick GD. Vaccines are not associated with autism: an evidence-based meta-analysis of case-control and cohort studies. *Vaccine*. 2014;32(29):3623-9.
21. Türkiye Cumhuriyeti Sağlık Bakanlığı. Aşı İçerikleri. Erişim Tarihi: 16.06.2019 <https://asi.saglik.gov.tr/genel-bilgiler/36-asi-icerikleri.html>.
22. Hoffman BL, Felter EM, Chu K-H, Shensa A, Hermann C, Wolynn T, et al. It's not all about autism: The emerging landscape of anti-vaccination sentiment on Facebook. *Vaccine*. 2019.
23. The LCAH. Vaccine hesitancy: a generation at risk. *The Lancet Child & adolescent health*. 2019;3(5):281.
24. BBC. YouTube takes ads off 'anti-vax' video channels. Erişim Tarihi: 17.06.2019 <https://www.bbc.com/news/technology-47357252>.
25. Zimmerman LA, Muscat M, Singh S, Mamou MB, Jankovic D, Datta S, et al. Progress toward measles elimination—European Region, 2009–2018. *Morbidity and Mortality Weekly Report*. 2019;68(17):396.
26. Thornton J. Measles cases in Europe tripled from 2017 to 2018. *British Medical Journal Publishing Group*; 2019.
27. European Centre for Disease Prevention and Control. Measles. Erişim Tarihi: 02.07.2019 <https://ecdc.europa.eu/en/measles>.